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Teaching about Architecture and Urbanism in Elementary School

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Abstract

Comparing the curricula of various teaching areas, our goal was to provide an overview of the existing themes and concepts related to architecture and urbanism being taught, as well as the context in which students are introduced to them. Also, we were interested in the outcome of the existing approach to these topics, i.e., we wanted to find out what knowledge and competences were acquired by students.

Key words: *competence; education system; school curricula; space; teaching area*

Introduction

“Architecture and the built environment – our buildings, villages, towns, cities and landscapes – provide the framework for all human activity and interaction. We give it form and it forms us. It affects mind, spirit, body, the ways we move from place to place and the people that we meet. It involves collective, social and critical action. Through symbolic, significant, public and private structures and spaces it represents the values of a community in concrete form. (...) The future quality of our environment will be determined by the children of today. Their ability to make sound, informed decisions will depend on the knowledge, skills and abilities they gain in the course of their education. Home, school, neighbourhood and community send them a message about their place in the world. For good or ill the environment provides the context, the ‘*cadre de vie*’ which so affects the physical and psychological quality of their lives, and in which they start to grow into their future roles as citizens.”

From the mission statement of *Architecture & Children*, UIA Built Environment Education Network

Architecture and urbanism provide the framework for our life – the form in which our everyday activities take place. Unlike sculpture and painting, architecture and

urbanism are a sensory experience to which everyone is exposed on a daily basis. Regardless of whether that experience is good or bad (depending on how well our environment has been built), it develops our senses.

The experience of contemporary living tells us that sensory development needs to be systematically and structurally acquired and that the times are long gone when our surroundings and our senses developed spontaneously and in mutual balance, i.e., in harmony with each other's rhythm and pace.

Developing sensitivity for architecture or urban space does not necessarily entail an understanding of the historical development of architecture, its stylistic characteristics or technical achievements. It primarily involves a fundamental understanding of the "forms" of the space all around us, of our needs and activities linked to that space, and of our ability to transform that space according to our needs.

"Architecture does not consist in the sum of the width, length and height of the structural elements which enclose space, but in the void itself, the closed space in which man lives and moves" (Zevi, 1993, p. 20).

We have already stated that architecture and urbanism provide a framework for our life, which means that they are thrust upon us as the enforcers of our sensitivity almost as soon as we are born. That is why such topics should be systematically introduced to children at a very early (pre-school) stage. The draft architectural policy of the Republic of Croatia, *Apolitika*, presented in May 2012, stresses that "education about the significance of the quality of the built environment must include all individuals, from the earliest age to adulthood" (Ministarstvo zaštite okoliša, prostornog uređenja i graditeljstva, 2012, p. 32).

As no single teaching area integrates all these topics together, it is difficult to clearly analyze their current status within the existing education system.

Our research was twofold. Comparing the curricula of various teaching areas our goal was to provide an overview of the existing themes and concepts related to architecture and urbanism, and the context in which students are introduced to them. Also, we were interested in the outcome of the existing approach to these topics, i.e., we wanted to find out what knowledge and competences were acquired by students. Our findings could potentially serve as guidelines in reconsidering the approach towards these topics and their repositioning within the education system.

Current Approach to Architecture and Urbanism Related Themes

Architecture is a scientific and an artistic discipline. Considering the fragmentation of the social/natural sciences and the arts in the Croatian education system, it is not surprising that architecture and urbanism related themes have never appeared as well-rounded educational units.

Even within a single teaching area, such as visual arts education, these issues have been so fragmentized that it is sometimes difficult to link them directly to the contexts

of architecture or urbanism, and are instead only covered on the level of general visual arts concepts (e.g., rhythm, symmetry, etc.).

In the curricula of secondary schools (comprehensive secondary school and certain vocational schools), architecture and urbanism have a clear and a defined position of equal importance as painting or sculpture. As the subject of Visual Arts in secondary schools evolved from Art History, it was logical that architecture and urbanism become the major footholds of teaching content. Architectural monuments and urban localities play a central role in learning about a society's culture and way of life, its values, or its connection to a historical or political context.

As we live in a country that is trying to build its economic future on tourism, the knowledge of our architectural and urban heritage should be a fundamental educational value. In an even wider context, knowing and understanding such values should help us in understanding our society and its needs, and in creating an equally well-built environment.

But what about the themes that should be covered at the elementary school level?

In our opinion, there are several reasons why it is important to define which architecture and urbanism related themes should be part of the elementary school education.

Elementary schools are the only institutionalized segment of education which is equal for all members of society. Therefore, in eight years of elementary education, the system must enable us to acquire the fundamental knowledge that will help us to become individuals ready to face contemporary living. The fact that architecture and urbanism related themes are taught almost exclusively in secondary school is connected to the perception deeply rooted in our society that this is an elitist discipline which only future architects need to study in greater depth. Such an attitude neglects the fact that it is the duty of the entire society to preserve cultural and architectural heritage and that we all participate in shaping our personal and public surroundings. Future investors, policy/decision-makers, and the general public as future users of these spaces, should have a developed awareness of these issues. Everyone should have access to fundamental knowledge that helps them to successfully build and use their environment. These issues must be therefore introduced to everyone through elementary education.

Although some of them are a part of the elementary school curriculum, the lack of an integrating factor hinders their visibility, i.e., applicability in creating a unified experience and integrated knowledge.

We have prepared an overview of the themes and concepts more or less related to architecture and urbanism, which are covered by the elementary school curriculum. We were interested in finding out which themes and concepts were given more attention, whether they were equally represented in social studies and science subjects, whether there was any possible correlation across subjects, and whether there was continuous and vertical upgrading of these themes and concepts throughout the eight years of elementary school.

Table 1. Architecture and Urbanism Related Themes and Concepts in Various Subjects

Grade		Visual Arts	Science and Social Studies (1 st -4 th gr.) /History (5 th -8 th gr.)	Technology	Physics
1	ARCHITECTURE		Orientation in space, home, apartment, house		
	URBANISM		Place of living, environment		
2	ARCHITECTURE	Interior and exterior	Family home, apartment building Public spaces		
	URBANISM	Building, street, square	Town centre, country		
3	ARCHITECTURE				
	URBANISM		Perspective, horizon (scope, skyline), plan (physical plan of a town), sculptural relief, geography map, chart, country appearance, surroundings, environmental protection and preservation, cultural-historical monuments Landmarks, traffic		
4	ARCHITECTURE	Layout, wall, pillar, roof, architecture			
	URBANISM	City development	Cultural-historical landmarks in Croatia, Natural-geographical conditions, settlements, historical and cultural landmarks in different parts of Croatia		
5	ARCHITECTURE	Structure, construction	Croatian area in ancient times: Roman era, provinces, Greek and Roman cities, cultural landmarks (Arena and Forum)	Living environment and tasks of technology, analyzing space – classroom and things from our surroundings seen throughout the window, drawing layouts, floor plan and side view plan of an object, building a geometrical object out of cardboard, building a model	
	URBANISM				
6	ARCHITECTURE	Functionality of a space, spaciousness, layout, inter-spaces, balanced design/form, material and function	Differences between Roman and Gothic (architecture), Humanism and the Renaissance, cities and buildings in Europe and Croatia, Europe in the age of Baroque – impact of Baroque on lifestyle: palaces, town houses; Elective topics: 1. Towns in the Middle Ages, 2. Croatian culture in the Middle Ages	Standard layout symbols, drawing the classroom floor plan, scale, construction symbols, measures, Classroom technical drawing; construction materials	
	URBANISM				

7	ARCHITECTURE		First half of the 19 th century: developments in science and technology and their impact on daily life – urbanization and life in cities; major social and cultural changes to day-to-day living in the second half of the 19 th and early 20 th century – life in cities: developments in transport and communications; developments in construction	Types of drawings, based on method: sketch, original, copy (reproduction), schematic (blueprint).	Measuring length, area and volume of an object
	URBANISM				
8	ARCHITECTURE		First half of the 20 th century - world developments and Croatia: technological achievements: industrialization, transport, road construction; Croatia within the second Yugoslavia – basic features of construction development, industrialization; Croatia and the world at the brink of the third millennium – examples of distinguishable cultural and artistic movements and directions in the second half of the 20 th century. Elective topics: Croatian cultural identity		Dispersion of light
	URBANISM	Spatial design			

It is evident from Table 1 that social studies are predominant; fundamental themes and concepts related to the social aspects of architecture and urbanism are introduced from the first to the fourth grade in the scope of Science and Social Studies; but they are further elaborated from the fifth to the eighth grade in History classes.

In the first two grades, emphasis is put on developing a personal relationship towards the environment already built and the role it plays in the social function of space. The personal relationship is subsequently replaced by a wider social and historical context.

Visual Arts classes in the first four grades correspond with the topics covered by Science and Social Studies. However, the frequency at which such topics occur is almost negligible. In the first and the third grade, these topics are not even mentioned; in the second grade they are presented in one teaching unit, while in the fourth grade they are presented in two teaching units. If we consider the number of Visual Arts classes to which elementary school students are exposed, we can conclude that these topics are covered at most in approximately ten classes in the first four grades.

In higher grades, we notice a similar tendency. Concepts related to architecture and urbanism can be found in only three teaching units, and, even in them, it is not clearly defined whether they are presented through concrete examples.

The topics we have singled out from the Technology and Physics curricula indirectly refer to architecture and urbanism. Namely, the knowledge and competences based on

these topics represent just a tool that can be helpful in understanding certain aspects of architecture and urbanism. As there are no Visual Arts themes and concepts in sixth, seventh and eighth grades to enable the practical use of this knowledge, when students learn new concepts, opportunities are lacking for its logical application. We would also like to mention some illogical points, such as the fact that students are introduced to the concept of floor plans in Visual Arts classes in the fourth grade (they are required to master “reading” spatial relations in a very short period of time) while much more time is devoted to the same matter in Technology classes in the fifth grade, but the newly acquired knowledge cannot be applied on concrete examples.

We can notice certain continuity in the correlation between Science and Social Studies and History, which can consequently result in an integrated understanding of the taught aspects of architecture and urbanism. In this case, it refers to some basic knowledge about cultural heritage landmarks.

Knowledge related to Technology and Physics is not integrated with other subjects.

Visual Arts education is constrained by the number of available teaching hours and, in higher grades, by the lack of correlation with other subjects.

Based on Table 1, the topics being taught are distributed across educational areas, adhering only to the logics of an individual area and showing no correlation with other subjects. Such correlation is not possible because the contents, taught in different subjects in the same grade, is not aligned.

This fragmented learning leads to the accumulation of unrelated information. Awareness occurs rarely and is often detached from the wider context. We believe that this is a consequence of the general tendency to get specialized in a particular scientific or social discipline, but let us reiterate that specialization should not be the aim of education in elementary schools. The tendency towards specialization occurs frequently also in areas other than education, which creates some imbalance in many areas of human life. In his book *Seven Complex Lessons in Education for the Future*, Edgar Morin addresses this problem: “The predominance of fragmented learning divided up into disciplines often makes us unable to connect parts and wholes; it should be replaced by learning that can grasp subjects within their context, their complexity, their totality” (Morin, 1999, p. 20).

Morin goes on to emphasize: “We should develop the natural aptitude of the human mind to place all information within a context and an entity. We should teach methods of grasping mutual relations and reciprocal influences between parts and the whole in a complex world” (ibid.).

In that respect, integration and contextualization of learning should be one of the most important goals of contemporary teaching. Speaking about the existing curriculum, these goals can be achieved by:

- placing emphasis on the wider context while covering a certain educational unit (in terms of Visual Arts classes, this mostly means in one lesson/teaching hour, which is very time-constraining),

- placing emphasis on the wider context while covering a certain educational area (creating smaller or bigger thematic units),
- bringing into correlation different educational areas (as much as the curriculum allows),
- applying a project-oriented approach, which enables a more flexible and integrated approach to learning.

The curriculum itself and the way in which the teaching programme is organized should ensure that such directions are frequently used. We hope that these considerations will be reflected in the design of future curricula.

What We Have Learned about Space in Elementary School

As seen in the above analysis, architecture and urbanism related themes and concepts are dispersed across various educational areas, without being much interconnected. We wondered about the outcome of such an approach, i.e., what competences are acquired by students. We were not interested in individual and abstract knowledge, but in the manner and degree in which the acquired knowledge enables students to envision their surroundings, and create a personal approach while connecting their needs with the space around them.

Space was the key concept in this part of the research. Space is one of the aspects of man's interaction with his surroundings; and, in order to act, man needs to create concepts of space (Norberg-Schulz, 1975).

There is a variety of terms we use to describe space or its individual aspects. These terms are actually the indicators of different concepts of space that we build, i.e., they represent our construction of the world around us. This construction is the product of our individual motivations and life experiences. Our concepts of space are built over the years and shaped not only by our direct life experiences but also by the knowledge and experiences we acquire through education.

In that sense, the research we conducted using a survey was focused on determining which terms students used in describing space; whether they recognized only its physical and visual characteristics (and which ones) or whether they also included a personal dimension and/or human (inter)action in the description.

It was also focused on the students' approach to needs (personal dimension and human (inter)action) in relation to the space in which they lived.

The research included 78 seventh-graders from two elementary schools in Zagreb. The students were asked to answer a set of questions. The questionnaires contained the pictures of examples, as well.

In the first question, the students were asked to list at least five of their needs the space in which they lived should meet. The obtained responses mainly revealed that they did not distinguish their needs from the objects that could meet the needs.

In 53.13% of the responses, the students listed objects such as: television, sofa, computer, closet, video games, bathtub, bed... The majority of them specified objects meeting the needs of sleeping (49 responses), entertainment (40 responses) and nutrition (39 responses).

In 18.06% of the cases, the students named the rooms where a need was met: kitchen, bedroom, etc. The most frequently mentioned rooms included: kitchen (14 times), toilet (12 times) and bathroom (9 times).

In part, the students listed the rooms that should meet some of the needs: kitchen, living room, bedroom, bathroom, toilet.

Only 22.78% of the students listed (more or less articulately) the needs related to these spaces. The answers were mostly related to sleeping (15) and personal hygiene (14), then to rest (9), nutrition (8), sport (7), and learning/work (6). The need for privacy and outdoors (garden) was listed only by two students.

In 5.03% of the responses, the students tried to express their needs considering certain visual aspects of space. So they stated that the space in which they lived should be bright, big, airy, glass-walled or painted in light colours.

The lack of quite price answers and their poor articulation can be attributed to the fact that the students had not previously had the opportunity to consider the needs in relation to their living space. It is interesting that the students were more prone to link the need with a certain object, than with a space. This tells us that they are not used to thinking about space as a framework of their activities.

In the second question, we wanted to see what the students considered to be the characteristics of a certain space. They were thus shown the following four architectural examples:

- Le Corbusier, Unité d'Habitation in Marseille, 1952
- Ludwig Mies van der Rohe, Farnsworth House, 1951
- Le Corbusier, Ronchamp Chapel, 1954
- The Parthenon, 5th century B.C.

Each example was shown in two or three photos, including a floor plan or cross-section view (Unité d'Habitation, Le Corbusier). The task was to describe the characteristics of the space shown in each of the examples using approximately ten terms.

In addition, the students were asked in the last assignment to describe their school.

In 68% to 78% of the responses (depending on the example), the students used expressions that described the physical characteristics of the space or their visual experience. In doing so, they most frequently used expressions such as: big, high, wide, slanted, square, straight, long, geometrical, etc. Expressions that attempted to describe more complex visual syntax were used only a few times (2 to 3 expressions for each architectural example). The students here described the space as dynamic, static, rhythmic, open, and complex.

In 22% to 32% of the responses, the students used expressions trying to establish a personal relation towards the space. In such instances, words like nice and pleasant were used most often. Many of the answers were very imprecise and tended to replace the concrete depiction with a broader and vaguer term. Such are the words: excellent, ordinary, unusual, beautiful, interesting, fun, and great.

Describing living spaces (Le Corbusier, Unité d'Habitation), 3 students mentioned the privacy aspect of space, while 10 of them mentioned the well-organized and practical aspect of space. Only 3 students noticed that the apartment had two floors (the students were given a cross-section plan clearly showing the structure on two floors).

The students responded best when describing Farnsworth House. They mentioned the lighting (29), glass walls (20), connection with the nature (19), elevated position (18), airy aspect (17), openness and spaciousness (12), "simplicity" of the layout (4). The descriptions of Farnsworth House also had the best proportion of physical characteristics of space (68%) and personal views on space (32%). Also, the students incorporated positive attitudes into their descriptions, depicting the space as nice, comfortable, relaxing, and modern.

The most diverse expressions were used to describe Ronchamp Chapel. The students frequently focused their descriptions on details (benches, windows). They used the most terms in attempts to describe the lighting inside the building (51 different terms), but their accounts varied from "dark" to "filled with light" and "interesting light effects". Besides, the general impression was very different; the students described it using the following words: innovative, modern, old-fashioned, pleasant, uncomfortable, fun, mystical, artistic, strange, ugly, wonderful, and imaginative.

Describing the Parthenon, 43 students recognized the construction as historic (foreign) or, more precisely, related it to the ancient times or Greece (10 students). Five students specified that the construction had been used as a temple. Although this knowledge was not required of them, it is interesting that many of them decided to provide such information. In their answers, 25 students described the construction as a ruin, but 2 students thought it was an unfinished building. A total of 28 students stressed the importance of the pillars, but only one mentioned the sense of dynamics achieved by them.

The school description was of their particular interest. Contrary to our expectations about the space where they spent much of their time, the students focused on describing or listing details and individual rooms (kitchen, teacher's lounge, computer, blackboards, curtains) rather than they observed the school as a whole. We saw here the largest disproportion between the expressions they used to describe the physical or visual characteristics of space and those used to describe their personal relation towards the space (77.88% – 22.12%). It is also interesting that no more than three of the same or similar expressions were ever repeated. The general impression was more negative than positive and, in their descriptions, the students used words such as: ugly, dirty, boring, messy, and unmodern.

The prevalence of physical characteristics or visual impressions of space again indicated that the students were not used to thinking about space as a framework of their activities. This was particularly evident from the descriptions of their school, fragmentized into depictions of certain objects, details or functions of the rooms. Here we could see a similar tendency as in their answers to the first question, when the students related the fulfilment of their needs rather to objects than to spaces. The words they used in their descriptions were very imprecise and often made the impression that the students did not know how to express their initial experiences. Very rarely did they notice and describe a more complex visual syntax. The best responses, achieved in describing Farnsworth House, could be attributed to the fact that they found it the easiest to describe because of its dimensions and straightforward structure. They found it more difficult to connect different information about the same space into a coherent picture. It was also interesting that, although they had a floor plan for each example, the students did not describe the space layout (partially except for Unité d'Habitation).

These are all the experiences that should be developed in Visual Arts classes. Another important issue is the significance of using textbooks that provide continuous exposure to various presentations of spaces.

As was mentioned earlier, continuous learning about architecture and urbanism related themes is best achieved in the correlation between Science and Social Studies and History, so it was not surprising that the students recognized the historical context of a construction such as the Parthenon. This tells us that establishing some continuity and frequency of exposure to a certain matter is of great importance in learning.

Conclusion

We are aware that the data collected in this research do not provide a detailed insight into proficiency in terms of the taught material or general knowledge related to architecture. However, we believe that they do point to the main drawbacks of the existing approach.

Although students do learn about certain themes/concepts and acquire a certain amount of knowledge, they are deprived of a broader educational aspect that would allow them to gain an applicable and integrated experience. Here, we again see the recurrent shortcoming of the Croatian school system, which favours the accumulation of fragmented facts, without building fundamental competences. Students are not encouraged to make their own opinions and better understand the role of every person in building the environment.

The moderate vocabulary and insufficient visual syntax also indicate that students lack the knowledge previously needed to be able to follow Arts classes in the secondary school.

These deficiencies should be solved by harmonizing the contents of different subjects, developing the conditions for better correlation and integration of teaching

areas, and creating a common ground that would facilitate the supervision and implementation of these teaching blocks and make them more visible in the school system. This common ground should be found within the Visual Arts curriculum, but this would entail an increase in teaching hours, i.e., at least two classes per week again. Elective classes are also a solution, but a partial one at best.

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Poučavanje o arhitekturi i urbanizmu u osnovnoj školi

Sažetak

Uspoređujući kurikule različitih područja poučavanja, naš cilj bio je dati prikaz postojećih tema i koncepata koje se odnose na arhitekturu i urbanizam, kao i kontekst u kojem se učenici upoznaju s temama. Također su nas zanimali rezultati postojećih pristupa tim temama, npr. koje su kompetencije i znanja učenici usvojili.

Ključne riječi: kompetencije; obrazovni prostor; prostor; prostor za poučavanje; školski kurikulum